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XLV. *Of the vitriolic Waters of Amlwch, in the Isle of Anglesey; with occasional Remarks on the Hartfell Spaw, described in the first Volume of the Edinburgh Essays and Observations physical and literary, and in the 49th Volume of the Philosophical Transactions, and their Comparison with other Waters of the same Class.* By John Rutty, M. D.

Read Jan. 17, 1760. **T**HE truly vitriolic waters, altho' by much the strongest of the chalybeates, are so rare in comparison of the ordinary chalybeates, that we have scarce any accounts of them in the memoirs of the learned, nor any particular histories of such waters, until of late; and therefore, it is presumed, that an additional account of a certain notable water of this class may not be deemed unworthy of being preserved.

Such a water is that of Amlwch, situate on Traflwyn mountain, in the parish of Amlwch, in the Isle of Anglesey, which was sent me by Ambrose Lewis, of Beaumorris, having been bottled May 31, 1757, and arrived in Dublin June the 3d following.

It appears, by the hydrometer, to be as light as distilled water, notwithstanding its strong impregnation.

It is of a subacid taste, and very nauseously vitriolic; a lasting impression of that sort continuing in the throat giving suspicion of copper, of which, however,

however, it exhibits no evidence, by any degree of the hue of that metal imparted to polished knives immersed in it, nor of sulphur, by discolouring silver. It retained the above-mentioned taste, on being exposed several days in an open vessel; quite otherwise than happens to our ordinary chalybeates.

It curdled with soap: it also curdled equal parts of milk, exhibiting a pretty clear whey.

With spirit of hartshorn, spirit of sal ammoniac, and the solution of potashes, it exhibited ochreous and green grumes, as the martial vitriol.

Its appearances with galls, and other austeres, were very singular, and worthy remark: for tormentil roots gave it only a dilute ink colour, soon fading; and green tea a dark dun colour, on standing. It had not blackened the corks, except perhaps one out of six, that stopped the bottles sent me; and when the water was first poured out, it struck no more than a slightly bluish tincture with galls; which tincture, on standing all night, became like a dilute ink; but in a glass exposed thirty-two hours, the galls struck the dilute ink colour sooner: and in some of the water, which I left exposed four days, and in some of it, which I left in a phial corked, but only three quarters full, three weeks, the effect was very different; for to each portion of water so exposed, as I have just now mentioned, the galls imparted a most beautiful bright sky blue; which blue tincture, a little spirit of vitriol instantly destroyed.

Hence we may see the fallacy of trusting to a few appearances, and the danger of rash conclusions, without repetitions of experiments and observations; which, if they had been omitted, I had been led to
conclude

conclude this water to be but slightly impregnated with either a chalybeate or vitriolic principle; with which last it is, however, assuredly strongly saturated, altho' the ordinary taste with galls does not discover it clearly by the blue tincture, until the dissolving acid is partly exhaled.

THE ANALYSIS.

It deposits an ochre, which serves for painting.

It also deposits in the bottles a sediment partly of a red and yellowish colour, and partly white and raggy; which sparkled, and smelt strong, on the red hot iron.

Two pounds eleven ounces yielded 16 grains (*i. e.* a gallon 49 grains) of a light green sediment, of an acid smell, and of an highly acid, vitriolic, and nauseous taste.

It ferments strongly, both with solution of potashes, and with spirit of sal ammoniac; and separates a green and ochreous matter with the last.

Galls added to its dilutum in distilled water turned it of a deep blue; the characteristic of martial vitriol, to which it also agrees in the experiments of the last paragraph.

It produced some degree of coagulation with albumen ovi; and some slight opacity, and small grumes, with saliva.

It turned of a brown greenish colour with syrup of violets.

It was not attracted by the magnet, until roasted in the crucible; and then it was strongly attracted, and turned as red as minium.

From

From the above experiments, it appears, that Amlwch water is strongly impregnated with an acid martial vitriol.

It kills all the fish in its passage.

It has sometimes been drunk ; but cannot be borne in a greater dose than half a pint, unless diluted with common water, being otherwise vomited up.

It cures the mange in horses, and the itch in men, by bathing.

From the above account of the Amlwch water, it appears evidently to agree to that of the Hartfell, above-mentioned, and described in the Edinburgh Essays, and in the Philosophical Transactions, even in certain distinguishing characters common to both, and in which they differ from our ordinary chalybeate waters ; viz.

1. In the acid and vitriolic taste, which, moreover, they retain, when long kept, and at a distance from their fountains ; and even upon boiling, yielding an acid vitriolic salt, on exhaling to dryness, which the common chalybeates never do, but lose their strength by a small degree of heat.

2. In the blue tincture, which they give with galls ; another distinguishing character of English vitriol, of which a weaker solution, like the common chalybeates, gives only the purple colour with galls.

3. In exhibiting green clouds, or grumes, with oil of tartar, like the martial vitriol.

The same, or like appearances, are exhibited by the Shadwell water ; by another at Swanzey in Wales ; and, upon a late diligent search into the waters of this kingdom, by those of Kilbrew, in the county of Meath ; of Ballymurtogh, in the county of Wick-

low; and of Crofs and Coshmore, in the county of Waterford, and some others: and, to conclude, as crystals of martial vitriol have been demonstrated in several of them, I shall not hesitate to pronounce them *acid vitriolic waters*; which waters, as they are new in practice, and different in operation and effects from the common chalybeates, I apprehend it will be worth while to endeavour to place them in a more conspicuous point of view, which the histories lately given of the British waters of this class above-mentioned, compared to our own, will enable us, in some measure, to do.

There are, indeed, in these waters different degrees of acrimony; for tho' most of them are so acid as to curdle milk, yet this is not altogether universal; and tho' in many of them the acid is so far developed in their solid contents, as to ferment with alkali's, this appearance is not always conspicuous; from whence one would imagine, that the milder sort might be used with more freedom, or less danger: and yet it is certain, that one of the sharpest of them all, *viz.* ours at Kilbrew, in the county of Meath, hath been taken inwardly, with amazing success, in some very stubborn cases.

Yet, on the other hand, it hath been observed, that even the German spaw sometimes hath proved too irritating in some tender constitutions, where our ordinary milder chalybeates have succeeded well; and we are otherwise informed, by an accurate observer, that, in some tabid cases, particularly that called the galloping consumption, the mildest and lightest of our own chalybeates, and even altho' blended with milk,
have

have been found to increase the hectic heats and tension of the pulse.

Now, this observation seems not easily reconcilable to another of Dr. Horfeburgh, in the place above-mentioned, on the Hartfell spaw (a much stronger and harsher chalybeate than either the German spaw, or any of our ordinary chalybeates), *viz.* that it hath actually been given, with notable success, from half a pint to a pint a day, in consumptions of the lungs, far advanced, even attended with hectic heats and night sweats.

So memorable a fact, in the cure of a deplorable disease, deserves attention; and the Scotch physicians in that neighbourhood are called upon to corroborate it by further observations; as how long those cures stood, and how far they may have been confirmed by the like success in similar cases; whether used with or without milk; and lastly, whether, as an acid austere medicine, they may cool, correct, and give a better consistence, in a colliquative state of the blood; seems well to deserve further inquiry, and that the result should be communicated for the public utility.

There had indeed formerly obtained a general prejudice against the use of the ordinary chalybeates in diseases of the lungs; but, at length, experience hath convinced us, not only of their safety, but usefulness, and good effects, especially when tempered with milk, in many of those cases. And moreover, it is but doing justice to our acid vitriolic waters, to acknowledge, that the empirical trials made on them by the giddy vulgar have been frequently such, as demonstrate, not only their safety, but even powerful effects in other rebellious disorders; as, particu-

larly, our Kilbrew water (one of the sharpest and most strongly saturated with martial vitriol of all these waters yet discovered), in the notable cure of an ascites, complicated with a jaundice, which I have elsewhere related; and I see no reason why physicians should not, in this as well as other cases, avail themselves of the happy success of such casual experiments.

In order, therefore, to promote a view of this kind; and, furthermore, as these vitriolic waters are better adapted for use than the ordinary chalybeates, as bearing carriage to remote places, and may be kept fit for use at all seasons of the year, and are to be preferred in medical intentions, whenever the strongest of the chalybeates are required, and can be borne; I shall here, from facts and observations made on the several waters of this sort, which have fallen under my notice, give a short sketch of their general operation and good effects, as a foundation for further improvements.

These waters, then, generally operate as an emetic or cathartic, or both; and have recommended themselves, in external and internal use, as a powerful detergent, repelling, bracing, styptic, cicatrizing, antiscorbutic, and deobstruent medicine, as hath appeared by the notable cures they have effected, not only by external use in inveterate ulcers, the itch, mange, scab, tetters eruptions, scald head, and sore eyes; but also by internal use in hot tetters eruptions, dysenteries, internal hæmorrhages, in gleets, the fluor albus, and diarrhæa, in the worms, agues, dropries, and jaundice.

Such

Such hath been the success, that has not unfrequently crowned the empirical use of these waters; which, though, in some of these cases, it might undoubtedly have been better conducted in the hands of the prudent physician, may, however, suffice to convince us, that the vitriolic waters are a branch of the materia medica, not to be despised nor overlooked, in the cure of many stubborn chronical diseases.

Dublin, 15 February, 1750.

XLVI. *An Account of that Part of America, which is nearest to the Land of Kamtchatka; extracted from the Description of Kamtchatka by Professor Krasnennicoff, printed at Petersburg, in two Volumes, 4to. in 1759; and translated and communicated by the Rev. D. Dumaresque, D. D. Chaplain to the English Factory at Petersburg.*

CHAPTER X.

Of America.

Read Jan. 24,
1760.

ALthough we have no exact and circumstantial accounts of America, which lies east of Kamtchatka, for which reason, the description of that country might be deferred to the time, that the voyage to America, at the Kamtchatka expedition, will be published; nevertheless,